FOREST MANAGEMENT UPDATE

by
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POCKET COMPUTERS

As many of you know, I spent some time working with pocket computers and programmable calculators in Durham, New Hampshire, before transferring to Morgantown. I have continued that work, primarily with the Radio Shack PC-1 and PC-2. It is important to understand that these pocket computers do not replace microcomputers. They fill a different niche. They are relatively inexpensive machines that have the advantage of being very portable. At this time, Martin Dale's growth and yield model, "GROAK", and an investment analysis program have been completed for use on the PC-1 and PC-2. In the next six months, two timber inventory programs will be developed.

The State of Maryland has purchased a PC-1 for each service forester's use. In January of 1984, they received training on how to use the GROAK and Investment Analysis programs to solve practical forestry problems. At the same time, they received instruction in Economics from Joe Michaels of our Area Office. Delaware attended the same training session and used a PC-2.

West Virginia is planning to put a PC-2 in each district office. Hopefully, at a later date, each service forester will be able to have one readily available for his or her use.

BOTTOMLAND HARDWOODS

A 1½ day training session on bottomland hardwoods was planned for Maryland and Delaware in December, 1983. Frank Shropshire and John Vann from State and Private Forestry in Region 8 were to be instructors. Unfortunately, Frank became ill a few weeks before the session was to be held and we had to postpone it. Hopefully, it will be rescheduled for sometime this spring.

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BLACK WALNUT RESEARCH PLANTATIONS ON THE SHAWNEE

On October 25 and 26, I had the opportunity to spend two days looking at black walnut plantations on the Shawnee National Forest. The plantations are managed by the North Central Forest Experiment Station. Barbara Weber, FS-NC-1151 Project Leader, was the guide for both days. Felix Ponder accompanied us on October 26.

The trip was very educational for me and I want to share some of my observations with others who are interested. Many of the statements I will make are not at this time backed up by published research, but they are based on my observations, and the observations of lab personnel.

The format that follows is question and answer, which I think best conveys the information I gained during my visit.

1. QUESTION: Is interplanting of black walnut with other species a sound management practice?

   ANSWER: Yes, it is.

2. QUESTION: What are some advantages and disadvantages of the species that have been interplanted with walnut?

   ANSWER:

   Autumn Olive:

   Advantages

   a. Walnut grows very well with autumn olive. The olive does not overtop the walnut, but once it is established it prevents fescue and other competitors from occupying the understory.
   b. It is a nitrogen fixer.
   c. It provides good food and cover for wildlife.

   Disadvantage

   a. It will escape and spread into other open areas. It does not spread into forested areas, but it reproduces in old fields and along ditch banks.

   European Alder:

   Advantages

   a. It is a nitrogen fixer.
   b. It usually does not overtop walnut. In one plantation that was an excellent walnut site, however, the alder did overtop the walnut. On less-than-excellent sites, there has been no problem with European alder growing faster than walnut.

   Disadvantage

   a. It dies at a rather early age when it is interplanted with walnut. In many cases, it was dead by age 8. This allows other vegetation, like fescue, to occupy the site and compete with the walnut.

Black Locust:

Advantage

a. It is a nitrogen fixer.

Disadvantage

a. It overtops the walnut due to its early rapid growth. If it is not cut out of the plantation early, it will significantly compete with the walnut.

3. QUESTION: Why does interplanting help black walnut grow faster?

ANSWER: Part of the increased growth may be due to nitrogen fixation by the complementing species. It is also probable that part of the response is due to the elimination of competition from other species, like fescue. Another possible benefit from interplanting walnut with other species is an altered microclimate, which may be more beneficial to tree growth. The effects of wind are reduced, and moisture and sunlight amounts are altered. However, the exact reasons for better growth still have not yet been determined.

4. QUESTION: Is the management of the vegetation between trees critical to the management of the black walnut plantation?

ANSWER: Yes, the prescription for the plantation should include a prescription for managing the understory vegetation. If the understory vegetation is not controlled, the probability of plantation failure is high.

5. QUESTION: Can the understory vegetation be managed by establishing herbaceous cover between trees?

ANSWER: Yes, several species have been tried, and hairy vetch was found to be one of the best adapted for this purpose. However, it should not be sowed until a year after the walnut is planted. This will prevent the vetch from overtopping the walnut seedlings.

6. QUESTION: Once a plantation has slowed down in growth due to weed competition, will it respond to release?

ANSWER: In many cases, yes. One 7-year-old plantation was receiving heavy fescue competition. It was released by cultivation with a roto-tiller mounted on a small tractor. The response to release was dramatic.

7. QUESTION: Why do plantation border trees that adjoin the woods grow better than plantation trees away from the woods?

ANSWER: It is difficult to pinpoint exactly what all the causes are. However, the species composition of the ground vegetation is probably a very important factor in many situations. The microenvironment near the woods is often more suitable for the establishment and development of walnut seedlings. Often the competition from fescue is less severe near the woods.

8. QUESTION: Will mechanical cultivation with a roto-tiller or farm disc between rows harm the root system of plantation grown black walnut?

   ANSWER: No, not if the tilling is only 2-3 inches deep. Care must also be exercised to avoid barking the trees when operating the equipment.

9. QUESTION: What herbicide is the North Central Forest Experiment Station most frequently using for weed control in walnut plantations?

   ANSWER: Roundup is now used most often, although that does not imply any endorsement on the part of the NCFES. It has simply been found more convenient to use.

10. QUESTION: Can walnut plantations be successfully established on recently de-forested (cutover) sites?

    ANSWER: Yes, if it is a good walnut site, and weed control is applied as needed to manage the competing vegetation.

11. QUESTION: Is coppicing of poorly formed trees recommended?

    ANSWER: During the first year after coppicing poorly formed trees, the sprouts may appear to have better form. However, a few years later the resulting sprout trees usually show little improvement in form. The reason is that sprouts suffer from many of the same problems as the original trees, including frost damage, dieback due to insects or diseases, and susceptibility to browsing by deer. Therefore, the advantages of coppicing are few.

12. QUESTION: Is a high aphid population in a plantation an indication that it is not growing well?

    ANSWER: The effects of high aphid populations on walnut trees are not known. Possible effects include slowed growth or susceptibility to diseases, but they need to be documented. Low level populations probably have little effect on healthy trees.

OAK REGENERATION

Obtaining oak regeneration is a problem for many of you, especially on the better sites. I addressed the issue in response to an action item of a general management review for Maryland. The following is from that response.

My approach to addressing this issue will have three parts:

1.) What is the current state-of-the-art of obtaining oak natural regeneration?

2.) What research is currently being done on oak regeneration?

3.) What should we do now to regenerate oak based on our current level of knowledge?

What is the current state-of-the-art of obtaining oak natural regeneration?

There is a great deal that we don't know about obtaining oak regeneration naturally. Much of what we do know is summarized in a paper entitled "Management Strategies for Successful Regeneration: Oak-Hickory" by Kurt W. Gottschalk. This was presented at a conference on "Regenerating Hardwood Stands" at Penn State in March of 1983. I am attaching a copy of this presentation, and I propose that we consider it as the state-of-the-art on oak natural regeneration.

The Proceedings of "Regenerating Hardwood Stands" is available from Penn State University, and I regard it as a good resource document to have. Besides the above-mentioned article by Gottschalk, the Proceedings include a presentation on "Silvical Factors Affecting the Regeneration of Oaks and Associated Species in Pennsylvania" by Robert A. McQuilkin.

I am also attaching a copy of a memo from Kurt Gottschalk to Dave Marquis regarding recommendations for the treatment of understory vegetation to stimulate oak regeneration.

What research is currently being done on oak regeneration?

A. Growth and Culture of Central Appalachian Hardwoods - Parsons, West Virginia:

Research problem #3 at Parsons focuses on the need to develop hardwood regeneration guidelines to predict, establish, and control species composition to insure more successful restocking of central Appalachian hardwood stands with desired species. Eventually, this regeneration research should provide forest managers with specific regeneration guidelines to determine what species to expect or what practices are necessary to establish and control the desired species composition before a silvicultural regeneration treatment is made. Since oak is an important component in the Appalachian hardwoods type, this research will address the regeneration of oak species. Of the research projects I will discuss, this one is closest to Maryland, and the results should certainly be applicable in western Maryland.

B. Ecology and Management of Cherry-Maple and Oak Forests in the Alleghenies - Warren, Pennsylvania:

Kurt Gottschalk established a shelterwood study in oak on the Athens Ranger District of the Wayne National Forest in Ohio. This work is now being continued by Russ Walters. There are plots in areas with overstory treatment only, understory treatment only, and both overstory and understory treatment. Understory treatments include burning, mist blowing of small trees and shrubs, and tree injection of undesirable saplings and poles. Much of this study is now about two years old. When it is completed, it should give us a good indication of what treatments will most effectively establish oak advanced regeneration.

Similar understory and overstory studies are being pursued in Indiana and Missouri by Ivan Sanders' project in Columbia, Missouri. They are also doing work in those two states on underplanting red oak, and then releasing it once it is established.

C. Stand Development, Composition, and Growth of Southern Appalachian Hardwoods - Asheville, North Carolina:

David Loftis has been doing much of the recent red oak regeneration work at Asheville. They have work on two basic problems: 1.) how large must the advanced reproduction be to compete in the new stand?, and 2.) how can small established reproduction be developed so it can be competitive in the new stand?

We should have some results to help us with the first question in about two years. This work is similar to what was done by Ivan Sander in Missouri. The big difference is that in North Carolina they are working on much better sites than can be found in Missouri. Consequently, the results may be quite different.

To answer the second question, understory treatments were established as long ago as 1977. Undesirable understory species were injected with herbicide to encourage the advanced oak reproduction, but avoid providing too much stimulus to yellow poplar and other intolerant species. It appears that reducing the stocking by 35-45% from below is the appropriate treatment intensity. However, this treatment range needs fine tuning, and it is important to note this stocking includes all stems down to 1" dbh. Some published information on this research can be expected in about one year.

This project has not done much work on how to establish regeneration where it does not exist. That has not been a serious concern for them with red oak on their better sites.

What should we do now to regenerate oak based on our current level of knowledge?

If we expect to establish and encourage the development of oak regeneration, we need to practice even age management. We also know that we should have advanced oak regeneration established before removing the overstory if we want a good composition of oak in the new stand. The shelterwood cutting method is the most appropriate for establishing and developing oak regeneration. However, working in the overstory, with no treatment of the understory, will not suffice. While research has not yet identified the most effective understory treatment, we know that we need to discriminate against undesirable species in the understory to give a competitive advantage to the desirable oak species.

At this time, I feel it is appropriate to make investments in understory treatments to favor the establishment and development of oak regeneration. Tree injection of undesirable stems can be accomplished at a reasonable cost. We have a FIP site preparation for natural regeneration practice that can be used to encourage landowners to do this work. I am not under the illusion that this practice will be easy to administer. In many cases, it may be best to do the understory treatment independent of any commercial harvest. When this is the case, it should be done several years before the harvesting operation. Getting landowners interested in doing the work prior to doing a commercial harvest may be a problem. Once the regeneration is established, many landowners may be reluctant to remove the overstory and release it. If it isn't released, it won't accomplish our objective of maintaining an oak component in the new stand.

In spite of the difficulties we may encounter in trying to meet our oak regeneration objectives, I believe we should proceed and install appropriate treatment practices. We need to encourage service foresters to utilize the FIP practice to do understory treatments where they are appropriate. We also need to do what we can to insure that follow-up treatments will be accomplished when needed. The importance of subsequent treatments should certainly be identified in a management plan.

When we encounter landowners who are willing to invest with us in artificial regeneration of oak, we should give the practice serious consideration. If the appropriate site preparation and release activities are employed, artificial regeneration can succeed.

FIP ACCOMPLISHMENTS

Some of you have appropriately noted that you have experienced a decline in the amount of work being done under the cost-share programs. I decided to look at the FIP accomplishments for the past three years to see how severe our problem is. Sometimes it is good to know if what you are experiencing is unique to your state or if it is part of a general trend that your neighbors are also observing. I hope the chart on the page that follows will be helpful to you in that way.

Fip Accomplishments
1981 - 1983

State/Year	PNIP[1] MM Acs.	Planting Acres	Site Prep. Nat. Reg. Acres	TSI Acres	Grape-vines Acres	All Practices Acs.[2]	%Change[3]	All Fed. $ Dollars
DELAWARE	.3							
1981		572	0	40	0	612	base	62,591
1982		399	129	0	0	528	-13.7	36,306
1983		271	66	26	0	363	-40.6	29,905
INDIANA	3.5							
1981		200	209	5,351	310	7,522	base	148,367
1982		291	322	3,982	239	5,342	-29.0	103,955
1983		161	180	2,948	13	3,610	-52.0	66,009
MARYLAND	2.6							
1981		2,219	0	687	0	3,099	base	229,847
1982		1,865	62	314	0	2,253	-27.3	144,955
1983		1,766	41	215	0	2,091	-32.5	133,879
NEW JERSEY	2.1							
1981		45	710	1,024	0	1,779	base	27,891
1982		10	0	814	0	824	-53.7	16,391
1983		0	0	317	0	428	-75.9	9,312
OHIO	5.9							
1981		429	173	1,414	2,368	5,495	base	178,725
1982		519	42	1,542	2,957	6,206	+12.9	207,551
1983		379	81	1,977	1,825	4,292	-21.9	144,663
PENNSYLVANIA	13.5							
1981		448	0	1,803	460	2,771	base	145,179
1982		80	64	1,634	323	2,235	-19.3	114,702
1983		71	0	1,694	320	2,179	-21.4	115,668
WEST VIRGINIA	10.5							
1981		305	0	595	37	13,718	base	185,331
1982		152	0	615	102	9,095	-33.7	119,567
1983		290	0	1,018	284	3,204	-76.6	57,691
TOTALS	38.4							
1981		4,218	1,092	10,914	3,175	34,990	base	977,931
1982		3,316	619	8,901	3,621	26,483	-24.3	745,427
1983		2,938	368	8,195	2,442	16,167	-53.8	557,127

1/ Private non-industrial forest acres, from Table 1082 of Statistical Abstract of the U. S. - 1974.

2/ This column is more than just the sum of the previous four columns.

3/ This column displays the percent change from 1981.

FIP SILVICULTURAL THRESHOLDS

As you know, early last fall, a task force was formed to help revise the silvicultural thresholds for the FIP program in NA. The majority of the work of the task force was in the upland oak and northern hardwood types. There was a great deal of discussion and compromise required to enable us to arrive at concrete numbers that we could all live with. Revisions are still being made, but the following pages which have been reproduced from a recent report will give you some indication of where we are now.